

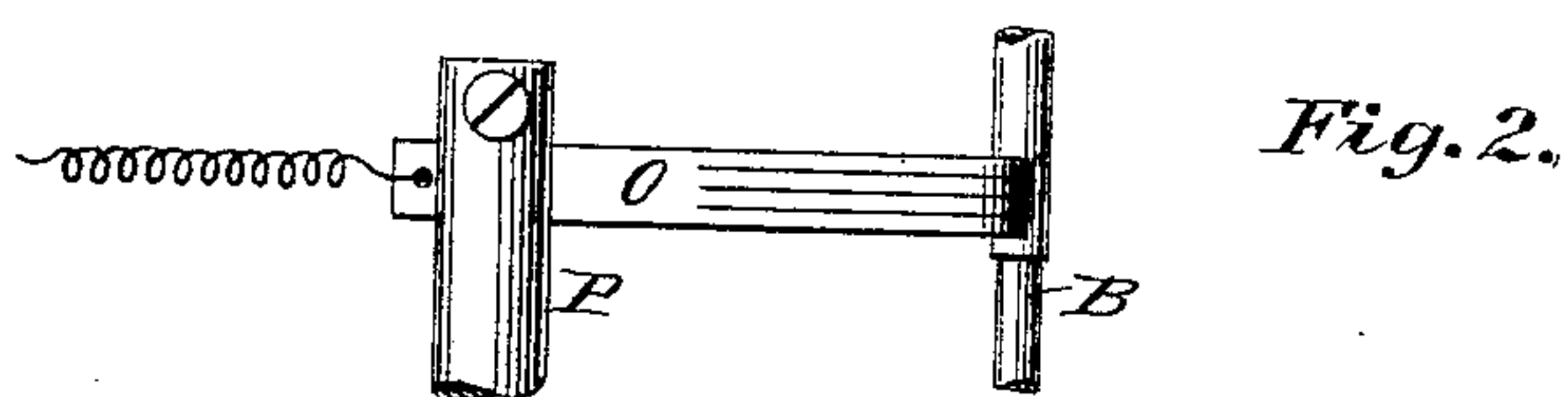
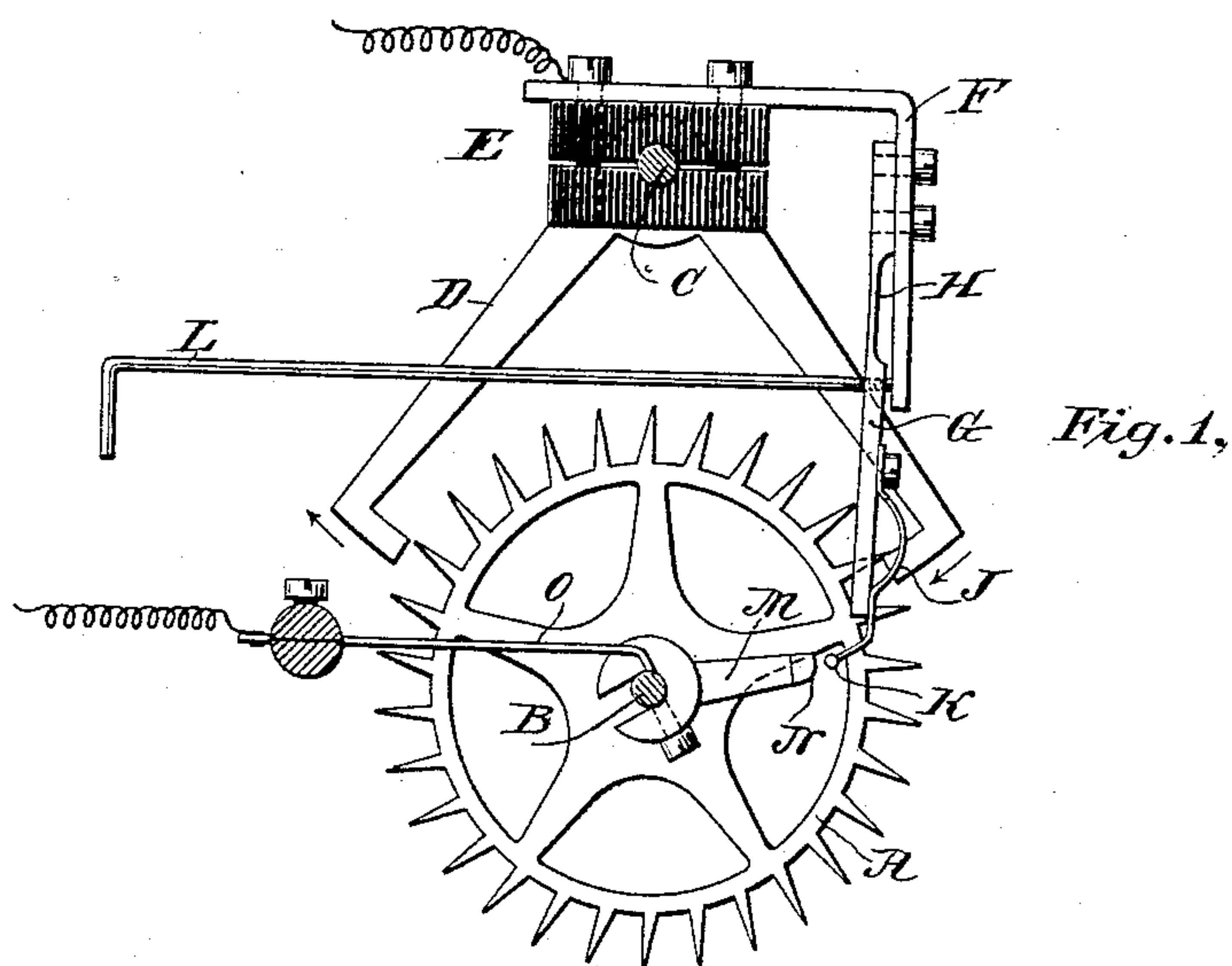
(No Model.)

C. D. WARNER.

CIRCUIT CLOSER FOR ELECTRIC CLOCKS.

No. 387,703.

Patented Aug. 14, 1888.



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UNITED STATES PATENT OFFICE.

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CIRCUIT-CLOSER FOR ELECTRIC CLOCKS.

SPECIFICATION forming part of Letters Patent No. 387,703, dated August 14, 1888.

Application filed May 7, 1888. Serial No. 273,034. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. WARNER, a citizen of the United States, and a resident of Ansonia, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Electric Clocks, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to electric clocks generally, but particularly to those electric clocks known as "regulators," and which are used to close an electric circuit for operating electric secondary clocks or otherwise. In these circuit-closing regulators or clocks it has heretofore been a matter of difficulty to construct and arrange the circuit making and breaking parts so that the desired accurate and continuous work may be done in the secondary clock or working-circuit.

15 This invention has for its object to improve these parts both as to their efficiency and accuracy of action and as to their adjustability; and the invention consists of parts and their arrangement, all of which will be hereinafter fully explained, and particularly pointed out in the claims.

20 The improvements are applied to the escapement parts of a clock, and therefore I have shown in the accompanying drawings these parts only of an electric clock, Figure 1 being an elevation view of a dead-beat anchor-escapement, and Fig. 2 being a plan view of the staff of the scape wheel.

25 Referring to these views in detail, A represents the scape-wheel, B the scape-wheel arbor, C the anchor-arbor, and D the anchor, all these parts being of the usual and well-known form of construction.

30 Upon the anchor-arbor are firmly clamped the two insulating blocks E, and to these blocks is fixed the right-angle carrying-arm F. To this arm is attached the spring-arm G, which is cut away at H, as shown, so as to confine its spring action to one place. At the lower end of this spring-arm is attached the contact-spring I. This spring has a bend, J, in it back of where its free end bears upon the arm, which bend permits its contact end K to be sprung back when requisite, but also insures

the contact always having the same normal position relative to the spring-arm.

L is an adjusting-rod, the inner end of which screws through the spring-arm and bears against the carrying-arm. Turning this rod causes the free end of the spring-arm to be bent away from or brought closer to the carrying-arm, and thereby adjusts the contact K inwardly or outwardly—to or from the scape-wheel arbor.

60 Upon the scape-wheel arbor B is clamped the other contact, M, which contact revolves with the scape-wheel. This contact is specially shaped—that is, it has a square end or face, the lower edge of which rounds off slightly, as seen at N.

O is a thin metallic spring bearing upon the scape-wheel arbor and supported from any convenient part of the frame of the clock-movement, as the post P. One wire forming the working-circuit is directly attached to this spring, and the other wire is attached to the carrying-arm F. The spring O is divided, as shown, into various parts or fingers, thus making it of the well-known brush form of contact.

75 The operation is as follows: The contact-spring will vibrate freely with every swing of the anchor until the scape-wheel contact is brought under it. Then, as the scape-wheel and this contact are held on the dead-beat, the spring-contact is brought against the scape-wheel contact and the circuit is closed. It is to be observed that the spring-contact will strike the flat surface of the other contact in the direction of an acute angle, and, the anchor swinging still farther inward, the spring-contact will slide down the plane surface of and onto the rounded surface of the other contact, the spring yielding and, if need be, lifting away from the spring-arm, thus causing these contacts to come together upon the angle indicated, insuring their sliding upon each other, and thereby effecting the closing of the circuit. Furthermore, the sparking will always be confined to the same place—the point of separation—instead of, as is common, occurring at different points of the contact-surfaces, according as they may be worn away or otherwise affected in their arrangement relatively to each other, and thereby burning away these surfaces

so that the circuit fails to close or does so irregularly—an objection that it is of the greatest importance in electrical clock-circuits to guard against.

5 It should also be noted that the relative positions and movements of the contact-carrying parts at the time of making the circuit are an important feature—that is, the arc of the swinging contact is concentric with the pal-
10 lets, and this contact strikes the revolving contact at such an angle that the desired sliding action is secured with the least resistance to the swing of the anchor.

The screw-rod on the spring-arm is an im-
15 portant though not necessary part of the contact mechanism. It aids to readily and quickly effect the adjustment of the contacts and to make such adjustment very fine and delicate, as must be to not affect the action of the anchor.

20 In clocks of this kind it is a matter of importance that the circuit be not formed through the bearings of the movement, because if so formed the resistance of the circuit is likely to vary, and oftentimes will be so high as to
25 prevent the designed action of the clocks in the working-circuit. To obviate such difficulty, I employ the brush contact-spring described. It bears directly upon the scape-wheel arbor, and by its location and construction insures a current of uniform strength al-
30 ways passing to the contacts designed to make and break the circuit.

I am aware that brushes of this kind have been variously applied to conduct an electric
35 current from one part to another part of an

electric circuit, and I do not claim the same as my invention; but I am not aware that such brush has been used to form part of a circuit through the escapement parts of an electric clock. Its use in this particular man- 40
ner here shown and described remedies difficulties heretofore experienced in this kind of mechanism and makes the action of secondary clocks more certain and positive.

I am also aware that the make and break 45 parts of an electric clock have been variously applied to the escapement parts, and I do not, therefore, broadly claim any such adaptation.

I have shown my improvements as applied to the anchor form of escapement; but it is ap- 50
plicable to other forms of clock-escapement, as will be readily understood by those skilled in the construction and use of electric clocks.

What I claim as my invention is—

1. In an electric clock, the combination, 55
with the scape-wheel and its anchor, the insulated arm F, mounted upon the anchor-arbor and carrying the contact-spring I, provided with the bend J, and the contact M, mounted upon the scape-wheel arbor, substantially as 60
described.

2. In combination with the escapement and scape-wheel, the arm F, the spring-arm G, carrying the contact-spring J K, the adjusting-screw L, and the contact N, all substantially 65
as described.

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